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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/599,160

**Applicant(s)**

HABETHA ET AL.

**Examiner**

Michael Mapa

**Art Unit**

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The applicant has amended the following:

Claims: 1-37 have been amended.

### ***Response to Arguments***

2. Applicant's arguments filed 12/28/10 have been fully considered but they are not persuasive.

The applicant argues features wherein a method for a distributed beaconing period protocol for a device in an ad hoc network of devices comprising the device performing dividing a medium access time into a sequence of at least one contiguous superframe beginning at a beacon period start time; partitioning the superframe into a slotted beaconing period having a plurality of contiguous beacon slots followed by a data transfer period and associating with at least one of an existing ad hoc network BP or creating a new ad hoc network BP as the BP of the device.

3. Before addressing the applicant's arguments, the examiner would like to clarify the position taken with respect to the applied art:

Suzuki discloses a radio communication system having a parent daughter relationship between piconets (ad hoc network), wherein Suzuki discloses a superframe and a TDMA frame having a beacon, contention access period and contention free period as well as disclosing each user being a controller and having daughter networks with the same format, wherein Suzuki discloses a parent network having a TDMA frame having a beacon and multiple users (user A, user B, etc.) and a contention partition and wherein each user is a daughter network having its own beacon, users and contention partition, therefore an ad hoc network that partitions a superframe into a slotted beaconing period having a plurality of contiguous beacon slots.

Heberling discloses a superframe format having a beacon period start time and duration, contention access period, contention free period and as well as having multiple time slots.

With regards to the applicant's arguments that Suzuki in view of Heberling fails to disclose or suggest a slotted beaconing period having a plurality of contiguous beacon slots and that the cited Figures and Paragraphs fail to disclose the claimed limitations. The examiner respectfully disagrees. Suzuki discloses a frame format for a parent network having a beacon (main beacon) followed by multiple users and a contention partition wherein each user (user A, B, C, etc.) is a daughter network frame having its own beacon (sub beacon of main beacon), its own daughter users (user D, E, etc.) and contention partition and each daughter users (user D, E, etc.) have their own beacon and daughter users, etc., therefore the parent's superframe has a multiple/slotted beaconing periods for each of its users daughter frames and having a plurality of

contiguous beacon slots for each of its daughter frames which have their own daughter frames having its own beacon and beacon period as well (the parent main beacon is contiguous to user A daughter network sub beacon which is contiguous to user D daughter network sub beacon and so on).

4. Therefore, the argued limitations read upon the cited references or are written broad such that they read upon the cited references, as follows:

#### ***Specification***

5. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

6. The disclosure is objected to because of the following informalities: The applicant has failed to provide proper headings for the specification and fails to distinguish which part belongs to the background, summary, drawings, etc.... The guidelines and headings are preferred and recommended to outline the various sections of the specifications. The guidelines and headings are recommended, however as the applicant argued are not required.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 5-7, 9-11, 21-22 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Patent Publication 2003/0169697 herein after referenced as Suzuki) in view of Heberling (US Patent Publication 2003/0214967 herein after referenced as Heberling).

Regarding claim 1, Suzuki discloses:

The applicant claims "A method for a distributed beaconing period protocol for a device in an ad hoc network of devices" (Fig. 4 & Paragraph [0183] of Suzuki, wherein Suzuki discloses having a parent daughter relationship between piconets, therefore an adhoc network).

The applicant claims "comprising the device performing: dividing a medium access time into a sequence of at least one contiguous superframe beginning at a Beacon Period Start Time; partitioning the superframe into a slotted Beaconing Period (BP) having a plurality of contiguous beacon slots, followed by a data transfer period" (Figs. 4 & 7 & 17 of Suzuki, wherein Suzuki discloses a superframe and a TDMA frame having a beacon, contention access period and contention free period as well as disclosing each user being a controller and having daughter networks with the same format, therefore a contiguous superframe having slotted beaconing period and contiguous beacon slots).

The applicant claims "and associating with at least one of an existing ad hoc network BP or creating a new ad hoc network BP as the BP of the device" (Paragraphs [0195] & [0199] of Suzuki, wherein Suzuki discloses participating as a daughter piconet in the adjacent piconet when receiving a beacon signal and becoming a parent piconet if no beacon signal is received).

Suzuki discloses having a beacon transmitting time (Paragraph [0173] of Suzuki). However, Suzuki fails to explicitly recite "beginning at a Beacon Period Start Time."

In a related field of endeavor, Heberling discloses:

The applicant claims "superframe" (Fig. 5 & Paragraph [0016] of Heberling, wherein Heberling discloses a superframe format).

The applicant claims "beginning at a Beacon Period Start Time" (Paragraph [0020] of Heberling, wherein Heberling discloses the beacon period having a start time and duration of the beacon period).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Suzuki to incorporate the teachings of Heberling of having a start time and duration of the beacon period for the purpose of having the system informed of when the beacons from each device will start and thereby provide the system with more accurate information to manage the system better.

Regarding claim 2, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 1, further comprising:  
if the BP of the device is not protected in at least one neighboring BP, protecting the unprotected BP in the at least one neighboring BP; and once the BP of the device is protected, operating normally" (Paragraphs [0207] - [0210] of Suzuki, wherein Suzuki discloses a daughter piconet appearing in a state with no timeslot assigned and the parent piconet assigning the unassigned area for the daughter piconet wherein once the daughter piconet receives the beacon signal from the parent piconet, the daughter piconet will start operating in the unassigned area).

Regarding claim 3, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 2, wherein the protecting the unprotected BP step further comprises including a first reservation for the



BP in the own beacon of the device in the at least one neighboring BP" (Paragraph [0206]–[0207] of Suzuki, wherein Suzuki discloses the daughter piconet sending a timeslot assignment request to the parent piconet, therefore the daughter piconet is sending a reservation request for its own BP).

Regarding claim 5, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 3, wherein the associating further comprises: choosing an empty slot of the BP of the device; and beaconing a beacon of the device in the chosen empty slot" (Paragraph [0206] – [0208] of Suzuki, wherein Suzuki discloses the daughter piconet sending a time slot assignment request from the parent piconet and receiving the parent piconet beacon signal including the unassigned area information so that the daughter piconet starts operating in the unassigned area).

Regarding claim 6, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 5, further comprising including information regarding the beacons of other devices in the own beacon of the device" (Fig. 4 of Suzuki, wherein Suzuki discloses the frame format of the parent having multiple users each user being a daughter of the parent network and each daughter network acting as a parent network having its own daughter network and beacons for other devices, therefore each parent network has a second reservation having the beaconing period of other devices).

Regarding claim 7, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 6, wherein the protecting the unprotected BP further comprises including a second reservation in the own beacon of the device to announce the BP of said other devices" (Fig. 4 of Suzuki, wherein Suzuki discloses the frame format of the parent having multiple users each user being a daughter of the parent network and each daughter network acting as a parent network having its own daughter network and beacons for other devices, therefore each parent network has a second reservation having the beaconing period of other devices).

Regarding claim 9, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 3, wherein the associating comprises: scanning the medium to detect at least one BP during the at least one superframe; if at least one BP is not detected, starting a new BP as the BP of the device at a beacon period start time calculated in a pre-determined manner" (Fig. 4 & Paragraph [0199] of Suzuki, wherein Suzuki discloses not receiving a beacon signal from an adjacent station and operating as its own parent piconet, therefore it conducts scanning to determine if a beacon signal having a superframe with a beacon period is received and if not detected starting its own piconet having its own beacon period with its own start time).

The applicant claims "and if at least one BP is detected, deciding to perform one: i. joining at least one of the at least one detected BP as the BPs of the device, and ii. starting a new BP as the BP of the device at a beacon period start time determined in a pre-determined manner" (Fig. 4 & Paragraph [0195]-[0196] & [0199] of Suzuki, wherein Suzuki discloses receiving a beacon signal from the adjacent station and comparing if

the address of the own station is newer than the adjacent station and deciding whether to join the adjacent station piconet as a daughter or operate as its own parent piconet).

Regarding claim 10, Suzuki in view of Heberling discloses "The method of claim 9." The examiner rejects claim 10 with the same arguments provided above (see claim 5).

Regarding claim 11, Suzuki in view of Heberling discloses "The method of claim 10." The examiner rejects claim 11 with the same arguments provided above (see claim 6).

Regarding claim 21, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 2, wherein the operating normally further comprises terminating the BP" (Paragraph [0153] of Suzuki, wherein Suzuki discloses clearing the unassigned area once the beacon information of the second piconet cannot be received because of a dynamic change in the communication environment).

Regarding claim 22, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 2, wherein the operating normally further comprises clearing a Distributed Reservation Protocol DRP BP reservation of the device when no beacons are received during the BP for a pre-determined clearing number of consecutive superframes" (Paragraph [0153] of Suzuki, wherein Suzuki discloses clearing the unassigned area once the beacon information of the second piconet cannot be received because of a dynamic change in the communication

environment).

Regarding claim 26, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 1, further comprising each device of the ad hoc network of devices beaconing in the same BP, by performing a selected one from the group consisting of: beaconing in parallel in each BP of each device of said network of devices" (Fig. 12 & Paragraph [0129] of Suzuki, wherein Suzuki discloses a first and second piconet coexisting in the same frequency channel for piconet operation, therefore in parallel with each other).

The applicant claims "and switching a BP to beacon in a same BP as other devices of said network of devices" (Fig. 4 of Suzuki, wherein Suzuki discloses having user D and user E to have the same beacon period, therefore when a device joins a daughter network it switches its own BP to beacon in the same BP as the other devices under the daughter network).

Regarding claim 27, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 26, wherein a device that does not have to switch its BP is chosen in a distributed way based on an identifier of each device of said network of devices" (Paragraph [0196] & [0199] of Suzuki, wherein Suzuki discloses comparing the address information to see which is newer and depending on that deciding whether to join an existing piconet or operate as a parent piconet).

Regarding claim 28, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 26, wherein a device that does not have to switch its BP is chosen in a distributed way based on the number of occupied beacon slots in the BP of each device of said network of devices" (Paragraph [0202] of Suzuki, wherein Suzuki discloses checking to see if the time slot request is practicable or if there are any time slot available; if there is, assigning a time slot to the adjacent station).

Regarding claim 29, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 26, wherein a device that does not have to switch its BP is chosen in a distributed way based on the size of the portion of the superframe that is reserved by the beacons in a BP of a device of said network of devices" (Paragraph [0202] of Suzuki, wherein Suzuki discloses checking to see if the time slot request is practicable or if there are any time slot available or time slot that hasn't been reserved by the beacons; if there is, assigning a time slot to the adjacent station).

Regarding claim 30, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 1, wherein each device of said network of devices may beacon in a different BP" (Fig. 4 of Suzuki, wherein Suzuki discloses the parent network having a beacon period and the daughter network having its own beacon period for user devices, therefore each device of said network may beacon in a different BP).

9. Claims 4, 8, 12-20 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Patent Publication 2003/0169697 herein after

referenced as Suzuki) in view of Heberling (US Patent Publication 2003/0214967 herein after referenced as Heberling) and further in view of Kondylis et al. (US Patent Publication 2003/0012176 herein after referenced as Kondylis).

Regarding claim 4, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 3, wherein the reservation is of type BP and priority = BP" (Fig. 17 & Paragraphs [0206] – [0207] of Suzuki, wherein Suzuki discloses the daughter sending a timeslot assignment request and the format of the request having a beaconing period, therefore the priority = BP).

Suzuki in view of Heberling fails to explicitly recite "a DRP reservation type."

In a related field of endeavor, Kondylis discloses:

The applicant claims "a Distributed Reservation Protocol DRP reservation type" (Paragraph [0100] of Kondylis, wherein Kondylis discloses using a distributed reservation protocol (DRP) for scheduling broadcast transmissions, therefore a DRP reservation type).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Suzuki in view of Heberling to incorporate the teachings of Kondylis of using a TDMA based distributed reservation protocol for scheduling for the purpose of ensuring data losses due to collisions are negligible (Paragraph [0100] of Kondylis).

Regarding claim 8, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 7, wherein the second reservation is of type BP and priority = BP" (Fig. 17 & Paragraphs [0206] – [0207] of Suzuki, wherein

Suzuki discloses the daughter sending a timeslot assignment request and the format of the request having a beaconing period, therefore the priority = BP).

Suzuki in view of Heberling fails to explicitly recite "a Distributed Reservation Protocol DRP reservation type."

In a related field of endeavor, Kondylis discloses:

The applicant claims "a Distributed Reservation Protocol DRP reservation type" (Paragraph [0100] of Kondylis, wherein Kondylis discloses using a distributed reservation protocol (DRP) for scheduling broadcast transmissions, therefore a DRP reservation type).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Suzuki in view of Heberling to incorporate the teachings of Kondylis of using a TDMA based distributed reservation protocol for scheduling for the purpose of ensuring data losses due to collisions are negligible (Paragraph [0100] of Kondylis).

Regarding claim 12, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 8, wherein the protecting further comprises including a third reservation in the beacon of the device in the neighboring BPs to announce the BP" (Fig. 4 of Suzuki, wherein Suzuki discloses the frame format of the parent having multiple users each user being a daughter of the parent network and each daughter network acting as a parent network and having its own daughter network and beacons for other devices, therefore each parent network has a second

reservation having the beaconing period of other devices as well as a 3<sup>rd</sup> reservation having the beaconing period of other devices).

Regarding claim 13, Suzuki in view of Heberling and further in view of Kondylis discloses "The method of claim 12." The examiner rejects claim 13 with the same arguments provided above (see claim 8).

Regarding claim 14, Suzuki in view of Heberling discloses:

The applicant claims "The method of claim 3, wherein the operating normally comprises receiving beacons over the medium" (Fig. 4 of Suzuki, wherein Suzuki discloses the parent network having daughter networks and each daughter networks having its own beacons, therefore receiving beacons over the medium).

The applicant claims "and when a beacon comprising of type BP is received" (Paragraphs [0206] - [0210] of Suzuki, wherein Suzuki discloses the daughter piconet being newly constructed in the same space as the parent piconet or moving from another space to the same space of the parent piconet requesting time slot assignment and transmitting a beacon signal).

The applicant claims "performing scanning for a new BP, and when a new BP is detected, protecting the new BP" (Paragraph [0195]-[0196] & [0199] & [0207]-[0210] of Suzuki, wherein Suzuki discloses receiving the beacon signal from an adjacent station and comparing to see which is newer and determining whether to be a parent piconet or a daughter piconet and allocating resources to the BP, therefore it is protecting the new BP by allocating resources for the new BP).



Suzuki in view of Heberling fails to explicitly recite "a Distributed Reservation Protocol DRP reservation type."

In a related field of endeavor, Kondylis discloses:

The applicant claims "a Distributed Reservation Protocol DRP reservation type" (Paragraph [0100] of Kondylis, wherein Kondylis discloses using a distributed reservation protocol (DRP) for scheduling broadcast transmissions, therefore a DRP reservation type).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Suzuki in view of Heberling to incorporate the teachings of Kondylis of using a TDMA based distributed reservation protocol for scheduling for the purpose of ensuring data losses due to collisions are negligible (Paragraph [0100] of Kondylis).

Regarding claim 15, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 14, wherein the protecting steps further comprises comprise the step of including a fourth reservation in the own beacon of the device to protect the BP" (Fig. 4 of Suzuki, wherein Suzuki discloses the frame format of the parent having multiple users each user being a daughter of the parent network and each daughter network acting as a parent network and having its own daughter network and beacons for other devices, therefore each parent network having multiple devices has multiple reservations such as a second reservation having the beaconing period of other devices as well as a 3<sup>rd</sup> and 4<sup>th</sup> reservation having the beaconing period of other devices).

Regarding claim 16, Suzuki in view of Heberling and further in view of Kondylis discloses "The method of claim 15." The examiner rejects claim 16 with the same arguments provided above (see claim 8).

Regarding claim 17, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 14, wherein the operating normally further comprises a device optionally switching BP if two or more BPs co-exist" (Fig. 12 & Paragraph [0210] of Suzuki, wherein Suzuki discloses the parent network assigning resources to any other network that newly appears in the same space, therefore two or BPS co-exist are switched).

Regarding claim 18, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 17, wherein the switching BP by the device further comprises including a special switching announcement field in a beacon to announce a new BP" (Paragraph [0196] of Suzuki, wherein Suzuki discloses comparing the address information to determine which is newer, therefore the address information is the special switching announcement field to announce a new BP).

The applicant claims "and beaconing for at least a predetermined announcement number of consecutive superframes with the beacon including the special switching announcement field" (Fig. 17 of Suzuki).

Regarding claim 19, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 18, wherein the beaconing step further comprises one selected from the group consisting of: (a) performing including a DRP reservation of type BP to protect the new BP, if the new BP is not already protected, and stopping transmission of the beacon, if the new BP is already protected; and (b) transmitting a beacon in the new BP" (Paragraphs [0207] - [0210] & [0153] of Suzuki, wherein Suzuki discloses a daughter piconet appearing in a state with no timeslot assigned and the parent piconet assigning the unassigned area for the daughter piconet wherein once the daughter piconet receives the beacon signal from the parent piconet, the daughter piconet will start operating in the unassigned area and continues to disclose clearing the setting of the unassigned area once the beacon information from the daughter piconet cannot be received due to a dynamic change in the communication environment).

Regarding claim 20, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 18, wherein the operating normally further comprises when a beacon comprising a BP switching announcement of another device is received, performing scanning for a new BP, and when a new BP is detected, protecting the new BP" (Paragraph [0195]-[0196] & [0199] & [0207]-[0210] of Suzuki, wherein Suzuki discloses receiving the beacon signal from an adjacent station and comparing to see which is newer and determining whether to be a parent piconet or a daughter piconet and allocating resources to the BP, therefore it is protecting the new BP by allocating resources for the new BP).

Regarding claim 23, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 14, wherein the operating normally further comprises when at least two BPs collide, until there are no longer any colliding BPs, repeatedly performing at least one of selected from the group consisting of: (a) performing searching each colliding BP for enough empty beacon slots for the devices of an other colliding BP, and moving at least one colliding BP to a non-colliding beacon period start time; and (b) performing searching the superframe for enough empty beacon slots for the BP, and moving the BP to the empty slots in the superframe" (Fig. 14 & Paragraphs [0163] & [0168]-[0175] of Suzuki, wherein Suzuki discloses the method for allowing the coexistence of a plurality of piconets using a same frequency channel without interfering each other).

Regarding claim 24, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 23, wherein the operating normally further comprises when an existing DRP reservation collides with a BP, moving the colliding Distributed Reservation Protocol DRP reservation to a non-colliding time" (Paragraphs [0171]-[0173] of Suzuki, wherein Suzuki discloses determining if there is any duplicate or colliding information and adjusting the information so that the assignment of the own piconet will not overlap the assignment of the other piconet, therefore since Suzuki discloses the adjustment of colliding information, one of ordinary skill in the art would recognize that the adjustment of the colliding information whether

the BP or the DRP reservation or any other information is dependent on the system and user needs and design).

Regarding claim 25, Suzuki in view of Heberling and further in view of Kondylis discloses:

The applicant claims "The method of claim 23, wherein operating normally further comprises moving the BP to a non-colliding time when an existing Distributed Reservation Protocol DRP reservation collides with a BP" (Paragraphs [0171]-[0173] of Suzuki, wherein Suzuki discloses determining if there is any duplicate or colliding information and adjusting the information so that the assignment of the own piconet will not overlap the assignment of the other piconet as well as disclosing adjusting the beacon transmitting time so as not to overlap with the other piconets).

10. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Patent Publication 2003/0169697 herein after referenced as Suzuki) in view of Kim et al. (US Patent Publication 2003/0103487 herein after referenced as Kim).

Regarding claim 31, Suzuki discloses:

The applicant claims "A distributed beaconing apparatus for an ad hoc network device" (Fig. 4 & Paragraphs [0183] & [0199] of Suzuki, wherein Suzuki discloses having a parent daughter relationship between piconets and a station having capabilities that can join to become a daughter piconet or become a parent piconet, therefore an adhoc network device).

The applicant claims "comprising: a receiver for receiving beacons and data transfers from other ad hoc network devices" (Paragraph [0195] of Suzuki, wherein Suzuki discloses receiving beacon signals).

The applicant claims "a transmitter for transmitting beacons of the device and data" (Paragraph [0197] of Suzuki, wherein Suzuki discloses sending a request to the control station of the adjacent piconet, therefore a transmitter).

The applicant claims "a distributed beacon period processing component that processes received beacons and beacons of the device for transmission" (Paragraph [0196] of Suzuki, wherein Suzuki discloses comparing the address of the own station with the adjacent station, therefore one of ordinary skill in the art would recognize that a processor is needed in complex machineries to perform such complex task).

The applicant claims "a controller operatively coupled to said distributed beacon processing component" (Paragraph [0199] of Suzuki, wherein Suzuki discloses the station to operate as a parent piconet, therefore it becomes a controller of the piconet).

The applicant claims "and configured to direct said processing component to i. divide the medium into a sequence of superframes comprising at least one slotted beaconing period (BP) and including a certain number of beacon slots, said slotted BP being followed by a data transfer period" (Figs. 4 & 7 & 17 of Suzuki, wherein Suzuki discloses a superframe and a TDMA frame having a beacon, contention access period and contention free period as well as disclosing each user being a controller and having daughter networks with the same format, therefore a contiguous superframe having slotted beaconing period and contiguous beacon slots).

The applicant claims "and ii. associate with at least one of an existing ad hoc network BP and a new ad hoc network BP as the BPs of the device" (Paragraphs [0195] & [0199] of Suzuki, wherein Suzuki discloses participating as a daughter piconet in the adjacent piconet when receiving a beacon signal and becoming a parent piconet if no beacon signal is received).

Suzuki fails to explicitly recite "each having a pre-determined beacon slot length."

In a related field of endeavor, Kim discloses "each having a pre-determined beacon slot length" (Paragraph [0036] of Kim, wherein Kim discloses generating a predetermined number of beacon slots arrayed at a predetermined time interval, therefore a predetermined beacon slot length).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Suzuki to incorporate the teachings of Kim of having a predetermined beacon slot length for the purpose of providing the system with better management capacities to determine if and when the system will be overloaded.

Regarding claim 32, Suzuki in view of Kim discloses:

The applicant claims "The apparatus of claim 31, wherein said controller is further configured to direct said distributed beacon processing component to:

- iii. protect the BPs of the device in neighboring BPs; and iv. operate normally, once the BP of the device is protected" (Paragraphs [0207] - [0210] of Suzuki, wherein Suzuki discloses a daughter piconet appearing in a state with no timeslot assigned and the parent piconet assigning the unassigned area for the daughter piconet wherein once the

daughter piconet receives the beacon signal from the parent piconet, the daughter piconet will start operating in the unassigned area).

Regarding claim 33, Suzuki in view of Kim discloses:

The applicant claims "The apparatus of claim 32, wherein the controller is further configured to: choose an empty slot of the BP of the device; and beacon a beacon of the device in the chosen empty slot" (Paragraph [0206] – [0208] of Suzuki, wherein Suzuki discloses the daughter piconet sending a time slot assignment request from the parent piconet and receiving the parent piconet beacon signal including the unassigned area information so that the daughter piconet starts operating in the unassigned area).

11. Claims 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Patent Publication 2003/0169697 herein after referenced as Suzuki) in view of Kim et al. (US Patent Publication 2003/0103487 herein after referenced as Kim) and further in view of Kondylis et al. (US Patent Publication 2003/0012176 herein after referenced as Kondylis).

Regarding claim 34, Suzuki in view of Kim discloses:

The applicant claims "The apparatus of claim 32, wherein the distributed BP processing component protects the BP of the device by including a reservation of type BP and priority = BP in the beacon of the device to announce the BP to neighboring devices" (Fig. 17 & Paragraphs [0206] – [0207] of Suzuki, wherein Suzuki discloses the



daughter sending a timeslot assignment request and the format of the request having a beaconing period, therefore the priority = BP).

Suzuki in view of Heberling fails to explicitly recite "a Distributed Reservation Protocol DRP reservation type."

In a related field of endeavor, Kondylis discloses:

The applicant claims "a Distributed Reservation Protocol DRP reservation type" (Paragraph [0100] of Kondylis, wherein Kondylis discloses using a distributed reservation protocol (DRP) for scheduling broadcast transmissions, therefore a DRP reservation type).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Suzuki in view of Kim to incorporate the teachings of Kondylis of using a TDMA based distributed reservation protocol for scheduling for the purpose of ensuring data losses due to collisions are negligible (Paragraph [0100] of Kondylis).

Regarding claim 35, Suzuki in view of Kim and further in view of Kondylis discloses:

The applicant claims "The apparatus of claim 34, wherein the distributed BP processing component is further configured to include information regarding the beacons of other devices in the beacon of the device" (Fig. 4 of Suzuki, wherein Suzuki discloses the frame format of the parent having multiple users each user being a daughter of the parent network and having its own daughter network and beacons for other devices).

Regarding claim 36, Suzuki in view of Kim and further in view of Kondylis discloses:

The applicant claims "The apparatus of claim 35, wherein the controller is further configured to control the distributed BP to: scan the medium to detect at least one BP during the at least one superframe; if at least one BP is not detected, start a new BP as the BP of the device at a beacon period start time calculated in a pre-determined manner" (Fig. 4 & Paragraph [0199] of Suzuki, wherein Suzuki discloses not receiving a beacon signal from an adjacent station and operating as its own parent piconet, therefore it conducts scanning to determine if a beacon signal having a superframe with a beacon period is received and if not detected starting its own piconet having its own beacon period with its own start time).

The applicant claims "and if at least one BP is detected, decide to perform one of: i. join one of the at least one detected BP as the BP of the device, and ii. start a new BP as the BP of the device at a BP start time determined in a pre-determined manner" (Fig. 4 & Paragraph [0195]-[0196] & [0199] of Suzuki, wherein Suzuki discloses receiving a beacon signal from the adjacent station and comparing if the address of the own station is newer than the adjacent station and deciding whether to join the adjacent station piconet as a daughter or operate as its own parent piconet).

Regarding claim 37, Suzuki in view of Kim and further in view of Kondylis discloses:

The applicant claims "The apparatus of claim 36, wherein for normal operation the controller is further configured to: when a received beacon includes at least one of a

Distributed Reservation Protocol DRP reservation of type BP and a BP switching announcement for an other device scan for a new BP, and when a new BP is detected, protect the new BP; when a beacon of a neighbor is received, protect the neighbor BP" (Paragraph [0195]-[0196] & [0199] & [0207]-[0210] of Suzuki, wherein Suzuki discloses receiving the beacon signal from an adjacent station and comparing to see which is newer and determining whether to be a parent piconet or a daughter piconet and allocating resources to the BP, therefore it is protecting the new BP by allocating resources for the new BP or the neighbor BP).

The applicant claims "when the device switches BPs announce in the beacon of the device, for a predetermined announcement number of consecutive superframes, that the device is switching BP" (Fig. 17 & Paragraph [0196] of Suzuki, wherein Suzuki discloses comparing the address information to determine which is newer, therefore the address information is the special switching announcement field to announce a new BP).

The applicant claims "optionally switch BPs if two or more BPs co-exist" (Fig. 12 & Paragraph [0210] of Suzuki, wherein Suzuki discloses the parent network assigning resources to any other network that newly appears in the same space, therefore two or BPS co-exist are switched).

The applicant claims "terminate the BP; clear a DRP BP reservation of the device when no beacons are received during the BP for a pre-determined clearing number of consecutive superframes" (Paragraphs [0207] - [0210] & [0153] of Suzuki, wherein Suzuki discloses a daughter piconet appearing in a state with no timeslot assigned and

the parent piconet assigning the unassigned area for the daughter piconet wherein once the daughter piconet receives the beacon signal from the parent piconet, the daughter piconet will start operating in the unassigned area and continues to disclose clearing the setting of the unassigned area once the beacon information from the daughter piconet cannot be received due to a dynamic change in the communication environment).

The applicant claims "when at least two BPs collide, until there are no longer any colliding BPs, repeatedly perform at least one function selected from the group consisting of- search each colliding BP for enough empty beacon slots for the devices of another colliding BP; and move at least one colliding BP to a non-colliding beacon period start time; and when an existing DRP reservation collides with a BP, moving the colliding DRP reservation to a non-colliding time of the data transfer period" (Paragraphs [0171]-[0173] of Suzuki, wherein Suzuki discloses determining if there is any duplicate or colliding information and adjusting the information so that the assignment of the own piconet will not overlap the assignment of the other piconet, therefore since Suzuki discloses the adjustment of colliding information, one of ordinary skill in the art would recognize that the adjustment of the colliding information whether the BP or the DRP reservation or any other information is dependent on the system and user needs and design).

### ***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Mapa whose telephone number is (571)270-5540. The examiner can normally be reached on MONDAY TO THURSDAY 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (571)272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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